

REMARKS

This is a full and timely response to the Final Office Action mailed May 19, 2006. Upon entry of the foregoing amendments, claims 1-23 are pending in the application. Claims 1, 11 and 18 have been amended. The subject matter of amended claims 1, 11, and 18 can be found in the originally filed specification in at least FIGs. 2, 3, 4A, 4B, 5A and 5B and the related detailed description. Consequently, no new matter is added to the present application. In light of the foregoing amendments and following remarks, Applicants request reconsideration of the application and pending claims.

I. Claim Rejections Under 35 USC § 103– Claims 1-23

A. Statement of the Rejection

Claims 1-5, 8 and 10 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent 6,762,367 to Audet *et al.*, hereafter *Audet*, in view of U.S. Patent Application Publication 2002/0044423 A1 to Primavera *et al.*, hereafter *Primavera* and U.S. Patent 6,962,829 to Glenn *et al.*, hereafter *Glenn*.

Claims 11, 12, 14, 16-19, 21 and 23 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Glenn* in view of *Primavera*.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Audet* in view of *Glenn* and *Primavera* as applied to claim 1 and further in view of U.S. Patent 6,396,712 to Kuijk, hereafter *Kuijk*.

Claims 15 and 20 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Glenn* in view of *Primavera* as applied to claims 11 and 18 and further in view of *Kuijk*.

Claims 6 and 7 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Audet* in view of *Glenn* and *Primavera* as applied to claims 4, 5, 12 and 21 and further in view of U.S. Patent Application Publication 2002/0139566 A1 to Strandberg, hereafter *Strandberg*.

Claims 13 and 22 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over *Glenn* in view of *Primavera* as applied to claims 12 and 21 and further in view of *Strandberg*.

B. Discussion of the Rejection

In order for a claim to be properly rejected under 35 U.S.C. § 103, the combined teachings of the prior art references must suggest all features of the claimed invention to one of ordinary skill in the art. See, e.g., *In Re Dow Chemical*, 5 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1988), and *In re Keller*, 208 U.S.P.Q.2d 871, 881 (C.C.P.A. 1981). *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988) (Citations omitted). Further, “[t]he mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.” *In re Fritch*, 972 F.2d 1260, 1266, 23 U.S.P.Q.2d 1780 (Fed Cir. 1992).

Thus, to establish a *prima facie* case of obviousness, the prior art (or references when combined) must teach or suggest all claim features. Applicants’ independent claims 1, 11 and 18, as amended, comprise a combination (of elements and features) that is not disclosed, taught, or suggested by the prior art.

Applicants’ independent claim 1, as amended, includes “an intermittent ground plane arranged substantially parallel to and interposed between the first and second surfaces of said flexible circuit, said flexible circuit configured with vias that pass entirely through the flexible circuit and arranged along an axis substantially orthogonal to the first and second surfaces, the vias disposed proximate said first type of electrical connection pad array and extending through breaks in the intermittent ground plane to electrically couple said first transmission line and said second transmission line, such that said vias minimize discontinuity in said intermittent ground plane and wherein the at least one pad of the first type of electrical connection pad array is collocated with a respective via.” The proposed combinations (namely, *Audet*, in view of *Primavera* and *Glenn*; *Audet* in view of *Glenn* and *Primavera* and further in view of *Strandberg*; and *Audet* in view of *Glenn* and *Primavera* as applied to claim 1 and further in view of *Kuijk*) fail to disclose, teach or suggest at least this feature of claim 1.

Applicants’ independent claim 11, as amended, includes “vias that pass entirely through the flexible circuit, the vias closest to a first region of electrical connection pads configured to receive a wirebond and offset from connectors on said second opposing surface, one of said vias electrically coupling said first transmission

line and said second transmission line wherein said wirebond generates electrical discontinuity and said via generates electrical discontinuity and wherein said via is proximate said first region of electrical connection pads for substantially collocating said electrical discontinuity caused by said wirebond and said electrical discontinuity caused by said via, thereby minimizing discontinuity in the electrical connection assembly.” The proposed combinations (namely, *Glenn* and *Primavera*; and *Glenn* and *Primavera* in view of *Kuijk*) fail to disclose, teach or suggest at least this feature of claim 11.

Applicants’ independent claim 18, as amended, includes “vias that pass entirely through the flexible circuit, the vias collocated with said plurality of bond pads configured to receive a wirebond and offset from connectors on said second opposing surface, said vias enabling electrical coupling of said first conductive layer and said second conductive layer, said vias disposed to minimize discontinuity in said circuit assembly.” The proposed combinations (namely, *Glenn* and *Primavera*; *Glenn* and *Primavera* in view of *Kuijk*; and *Glenn* and *Primavera* in view of *Strandberg*) fail to disclose, teach or suggest at least this feature of claim 18.

Audet apparently discloses an electronic package assembly with a substrate having horizontal signal wires. Vias traverse some of the horizontal layers and connect with at least one horizontal signal wire. (See Abstract.) *Audet* teaches away from Applicants’ claimed flexible circuit, assembly and method for at least the reason that *Audet* teaches vertical conductors that do not pass entirely through the substrate. (See FIG. 1A.) *Audet* requires intersecting connections with orthogonally arranged signal lines throughout the substrate to traverse the substrate. Thus, *Audet* discloses a package that increases discontinuities in the circuit assembly.

Primavera apparently discloses a component package having a substrate. The substrate has a component or chip section and a separate assembly section. At least a portion of the substrate is flexible such that the section can be folded to oppose each other. (See Abstract.) *Primavera* also teaches away from Applicants’ claimed flexible circuit, assembly and method for at least the reason that *Primavera* shows parallel coupled vias 46 (FIG. 3) that traverse a substrate. Each of the additional via connections associated with coupling a signal in the package increases discontinuities in the circuit assembly.

Glenn discloses a method for simultaneously fabricating integrated circuit packages. Bonding pads on an IC chip are connected to first metallizations on a substrate first surface. Interconnection balls or pads are formed at substrate bonding locations on a substrate second surface, the interconnection pads or balls being connected to corresponding first metallizations. (See Abstract.) *Glenn*, like *Audet* and *Primavera*, as described above, teaches away from Applicants' claimed flexible circuit, assembly and method for at least the reason that *Glenn* shows vertical conductors that do not pass entirely through the substrate without encountering a horizontally arranged conductor. (See, for example, FIG. 17.) These additional interconnections increase discontinuities in the package. In addition, *Glenn* further teaches away from Applicants' claimed flexible circuit, assembly and method for the additional reason that opposing transmission lines are not both arranged along a surface of the substrate.

Kuijk discloses a method and apparatus for coupling circuit components. The system includes a half-conductive layer forming a resistive network between mating substrates. (See Abstract.)

Strandberg discloses a printed wiring board with controlled line impedance. A first thin-film metal layer is formed on a planarized layer fabricated from multiple thin dielectric layers. A reduced pad footprint in the first thin-film metal layer allows a major portion of the first thin-film metal layer to serve as a reference, or ground plane to signal lines formed in a second thin-film metal layer that is separated from the first thin-film metal layer by a thin dielectric layer.

As shown above, *Audet*, *Primavera* and *Glenn* disclose features that teach away from Applicants' claimed flexible circuit, assembly and method which recite arrangements and steps that minimize discontinuities. Applicants note that the Supreme Court has held that "teaching away" from the claimed invention by the prior art is one important indicium of nonobviousness. *U.S. v. Adams*, 383 U.S. 39, 148 USPQ 479 (1966). The Federal circuit has also held that "teaching away" is strong evidence of nonobviousness. *In re Hedges*, 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986). Such teaching away should be weighed heavily in determining the nonobviousness of Applicants' claims.

Accordingly, Applicants respectfully submit that in addition to the failure of the cited combinations to disclose each feature of the amended independent claims (i.e., claims 1, 11 and 18), these claims are allowable because *Audet*, *Primavera* and *Glenn* (in any combination) teach away from Applicants' claims. Applicants further respectfully submit that *Kuijk* and *Strandberg* (alone or in combination with any of the proposed combinations of the cited references) do not remedy the failures of these combinations to arrive at the claimed inventions.

Further, Applicants respectfully submit that dependent claims 2-10, which depend from allowable independent claim 1; dependent claims 12-17, which depend from allowable independent claim 11; and dependent claims 19-23, which depend from allowable independent claim 18, are allowable for at least the reason that they depend from allowable independent claims. *In re Fine, supra*. Accordingly, Applicants respectfully request that the rejection of claims 1-23 under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

For at least the reasons set forth above, Applicants respectfully submit that pending claims 1-23 are allowable over the cited art of record and the present application is in condition for allowance. Accordingly, a Notice of Allowance is respectfully solicited. Should the Examiner have any comments regarding the Applicants' response, Applicants request that the Examiner telephone Applicants' undersigned attorney.

Respectfully submitted,

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